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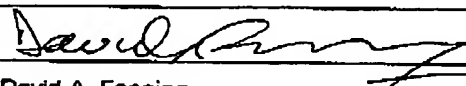
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In re Application of  
STEPHEN F. GASS and J. DAVID FULMER

Date: October 10, 2005

Serial No.: 10/053,390

Examiner Ghassem Alie

Filed: January 16, 2002

Group Art Unit 3724

For: CONTACT DETECTION SYSTEM FOR POWER EQUIPMENT

To: Commissioner for Patents  
Group Art Unit 3724  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

**APPEAL BRIEF****1. Real party in interest.**

The real party in interest is SD3, LLC, the assignee of the above-identified application. SD3 is a privately owned Oregon limited liability company.

**2. Related appeals and interferences.**

All other known prior and pending appeals, interferences or judicial proceedings which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal are:

Appeal of application serial number 09/929,426.

Appeal of application serial number 10/243,042. 10/12/2005 TL0111 00000009 10053390

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**3. Status of claims.**

The application was filed with claims 1-20. Claims 9-20 were cancelled without prejudice and claims 21-29 were added during prosecution. Claims 2-8 and 21-23 were withdrawn due to a restriction requirement. The appealed claims are claims 1 and 24-29.

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**4. Status of amendments.**

All amendments have been entered.

**5. Summary of claimed subject matter.**

Independent claim 1 describes a method for detecting accidental contact between a person and a dangerous portion of a woodworking machine (such as blade 40 in Figs. 3, 5-7 and 9). The method provides a first electrode coupled to a person (such as electrode 90 in Figs. 3, 5, 7 and 8) and a second electrode coupled to the dangerous portion of the machine (such as electrode 46 in Figs. 3, 5, 7 and 8). A signal is transmitted by one of the electrodes to the other and the signal is sampled a plurality of times within 200 microseconds to determine if the signal has a predetermined characteristic indicative of contact with a person (as described on page 13, line 21 to page 14, line 7 in the specification as submitted and in paragraph 36 of the published specification).

A table saw is one type of woodworking machine that may implement the method described by claim 1. In that saw, the first electrode could be coupled to a user and the second electrode to the blade. A signal processor in the saw could generate a signal to transmit from one electrode to the other. The signal processor could detect when the transmitted signal was received and then sample the signal as specified to detect contact between the person and the blade. Once contact has been detected, some action may be performed to mitigate any injury, such as stopping, retracting or covering the blade.

Independent claim 21 also describes a method for detecting accidental contact between a person and a dangerous portion of a woodworking machine. The method

provides a first electrode coupled to a person (such as electrode 90 in Figs. 3, 5, 7 and 8) and a second electrode coupled to the dangerous portion of the machine (such as electrode 46 in Figs. 3, 5, 7 and 8). A signal is transmitted by one of the electrodes and received by the other electrode. The signal is sampled a plurality of times to determine if the signal has a characteristic indicative of contact between a person and the dangerous portion of the machine (as described on page 12, line 17 to page 15, line 16, and page 19, line 10 to page 20, line 2 in the specification as submitted and in paragraphs 34-40 and 50 of the published specification).

#### **6. Grounds of rejection to be reviewed on appeal.**

The examiner rejected claims 1 and 24-29 under 35 USC 103(a) as obvious in light of Friemann (US Patent 3,858,095) combined with Hughes (US Patent 5,081,406) and Hokodate (US Patent 6,150,826). That is the sole ground of rejection presented for review.

#### **7. Argument.**

##### **Obviousness**

##### **Claim 1**

Claim 1 stands rejected under 35 USC 103(a) as obvious in light of Friemann combined with Hughes and Hokodate. Friemann discloses a band cutter used to cut textiles, Hughes discloses a system to detect proximity of a person to a saw blade, and Hokodate discloses a distance detector for focus control in laser beam machines. The examiner said Friemann and Hughes disclose all the limitations of claim 1 except for the limitation of "sampling [a] signal a plurality of times within 200 microseconds to determine if the signal has at least one predetermined characteristic indicative of

contact between a person and the dangerous portion" of a woodworking machine. Even though Friemann and Hughes fail to teach that limitation, the examiner concluded that a person of ordinary skill would have known to sample a signal a plurality of times within 200 microseconds because Hokodate teaches sampling a signal generally and, according to the examiner, only routine skill in the art would be required to go from sampling a signal generally to sampling a signal a plurality of times within 200 microseconds. The examiner rejected claim 1 based on the combination of these references.

The Board should reverse the rejection because: 1) Hokodate is non-analogous art, 2) there is no suggestion to combine the references, and 3) the cited references fail to teach or suggest all claim limitations. Each of these points is an independent reason why the Board should reverse the rejection.

1. Hokodate is non-analogous art.

The first step in an obviousness analysis is to identify the scope and content of the prior art. Graham v. John Deere Co., 383 U.S. 1, 17, 86 S.Ct. 684, 693-94, 15 L.Ed.2d 545, 148 USPQ 459, 467 (1966). In other words, one must determine what art may be properly considered. Art that may be considered is called "analogous" while art that may not be considered is called "non-analogous." See In re Clay, 966 F.2d 656, 658, 23 USPQ2d 1058 (Fed. Cir. 1992). Whether a reference is analogous is a question of fact. Id.

The Federal Circuit has identified two criteria for determining whether a reference is analogous art. The first is whether the reference is from the same field of endeavor as applicant's invention. If it is, then the reference is analogous. If it is not, then the second

criterion must be considered. The second criterion is whether the reference is reasonably pertinent to the particular problem addressed by the inventor. Id. at 658-659.

The Federal Circuit applied these criteria in the case of In re Clay, 966 F.2d 656, 658, 23 USPQ2d 1058 (Fed. Cir. 1992). In that case, the Federal Circuit reversed a rejection of claims to a process for storing liquid hydrocarbon in a tank having a dead volume between the bottom of the tank and its outlet. Id. at 657. The process included the step of placing gel in the dead volume. The claims were rejected in light of two references: Hetherington, which disclosed a petroleum storage tank that used bladders to fill the dead space at the bottom of the tank, and Sydansk, which taught using gel to fill anomalies in underground petroleum formations. Clay argued that Sydansk should not be considered because it was non-analogous art. The Board of Patent Appeals and Interferences, however, ruled that Sydansk was in the same field of endeavor, and therefore analogous, because the gel disclosed in Sydansk "would have a number of applications within the manipulation of the storage and processing of hydrocarbon liquids ... [and that] the gel as taught in Sydansk would be expected to function in a similar manner as the bladders in the Hetherington patent." Id. at 659.

Clay then appealed to the Federal Circuit. The first question addressed by the Federal Circuit was whether Sydansk was in the same field of endeavor as Clay. The court ruled that it was not, saying: "Sydansk cannot be considered to be within Clay's field of endeavor merely because both relate to the petroleum industry." Id. The court explained that Sydansk dealt with underground formations while Clay dealt with man-made storage tanks, and Sydansk's invention operated at high temperatures and pressures while Clay's invention operated at ambient temperature and atmospheric

pressure. Because of these differences, the court ruled that the two references were from different fields of endeavor: "Clay's field of endeavor is the *storage* of refined liquid hydrocarbons. The field of endeavor of Sydansk's invention, on the other hand is the *extraction* of crude petroleum. The Board clearly erred in considering Sydansk to be within the same field of endeavor as Clay's." Id. (emphasis in original).

The Federal Circuit then considered the second criterion, whether Sydansk was reasonably pertinent to the problem addressed by Clay, and stated:

A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem. Thus, the purposes of both the invention and the prior art are important in determining whether the reference is reasonably pertinent to the problem the invention attempts to solve. If a reference disclosure has the same purpose as the claimed invention, the reference relates to the same problem, and that fact supports use of that reference in an obviousness rejection. An inventor may well have been motivated to consider the reference when making his invention. If it is directed to a different purpose, the inventor would accordingly have had less motivation or occasion to consider it. (Id. at 659)

The Federal Circuit applied that standard and explained that the purpose of Clay's invention was to displace liquid from dead spaces in a storage tank while the purpose of Sydansk's invention was to recover oil from rock. The court also explained that a subterranean formation "is not structurally similar to, does not operate under the same temperature and pressure as, and does not function like Clay's storage tanks." Id. at 660. Because of these differences the court concluded that Sydansk was not reasonably pertinent to the problem addressed by Clay, and therefore, Sydansk was non-analogous and should not have been considered.

The situation in Clay is similar to the case at hand. Applicant's field of endeavor is a method to detect contact between a person and a dangerous portion of a woodworking machine while Hokodate's field of endeavor is "a distance detector for laser beam machine that can measure a laser focal position or nozzle height without any influence due to plasma or spatter generated during laser machining." (Hokodate, column 3, lines 48-51.) Woodworking machines and laser beam machines have different structures, operate under different principles, serve different purposes, and require different manners of operation. Clearly, the differences between these fields are greater than the differences between the fields of storing and extracting petroleum described in Clay, and as a result, applicant's invention and Hokodate are from different fields of endeavor. Thus, the question becomes whether Hokodate is reasonably pertinent to the problem addressed by applicant.

Hokodate is not reasonably pertinent to the problem addressed by applicant because Hokodate's laser beam machine would not have commended itself to an inventor considering how to make woodworking machines safer. Hokodate's disclosure would not have commended itself to such an inventor because that disclosure addresses a different problem, namely, how "to detect a focal position of a laser beam or a height of a nozzle" in laser beam machining. (Hokodate, column 1, lines 8-9.) Additionally, Hokodate would not have commended itself to an inventor considering how to make a woodworking machine safer because the danger presented by a woodworking machine comes from a moving blade and Hokodate's machine does not have a moving blade. In fact, the entire structure of a laser beam machine is different than a woodworking machine. A laser beam machine includes a laser, a focus lens, a



nozzle to direct the laser, and a distance detector to detect nozzle height above a workpiece (as shown in Fig. 14 of Hokodate), none of which is included in a typical woodworking machine. The function and operation of a laser beam machine are also very different from woodworking machines. A laser beam machine concentrates laser light into a spot on a metal workpiece to melt the workpiece and a gas jet blows away the melted material. (Hokodate, column 1, lines 60-67.) A woodworking machine, in contrast, includes a moving blade or cutting element against which a workpiece is moved to cut or shape the workpiece. Because of these differences, Hokodate would not have logically commended itself to an inventor considering how to make woodworking machines safer, and therefore, Hokodate is not reasonably pertinent to the problem addressed by applicant. Just as extracting petroleum was not reasonably pertinent to storing petroleum in Clay because of differences in purpose, structure, operation and function, woodworking machines and laser beam machines are not reasonably pertinent because of similar differences.

Another relevant case is In re Pagliaro, 657 F.2d 1219, 210 USPQ 888 (CCPA 1981). The invention in that case involved a process for preparing decaffeinated beverages. The invention used edible fats to extract the caffeine while the prior art used potentially toxic solvents. Id. at 1220. The examiner rejected the claims as obvious in light of a patent to Nutting combined with either a patent to Rector or an article by Aeillo. Nutting taught the conventional process of using solvents. Id. at 1221. Rector disclosed a method of making coffee by grinding coffee beans with oil and then extracting the oil, and Rector said the extracted oil was more heavily charged with the stimulative elements of the coffee. Id. Aeillo discussed the lipid theory of narcotics, and

specifically, the solubility of narcotics in fatty oils. *Id.* at 1221-1222. The Board of Patent Appeals and Interferences affirmed the rejection and Pagliaro appealed.

On appeal, the Court of Customs and Patent Appeals reversed the rejection because the Board misinterpreted Rector and because Aeillo was a non-analogous reference. The court's discussion of Aeillo is particularly relevant to the case at hand. The court explained:

We regard Aeillo as nonanalogous art, which cannot properly be considered pertinent prior art under 35 U.S.C. 103. In *In re Wood*, 599 F.2d 1032, 1036, 202 USPQ 171, 174 (Cust. & Pat. App.1979), this court stated: "In resolving the question of obviousness under 35 U.S.C. s 103, we presume full knowledge by the inventor of all the prior art in the field of his endeavor. However, with regard to prior art outside the field of his endeavor, we only presume knowledge from those arts reasonably pertinent to the particular problem with which the inventor was involved. (Citation omitted.) The rationale behind this rule precluding rejections based on combination of teachings of references from nonanalogous arts is the realization that an inventor could not possibly be aware of every teaching in every art. Thus, we attempt to more closely approximate the reality of the circumstances surrounding the making of an invention by only presuming knowledge by the inventor of prior art in the field of his endeavor and in analogous arts."

The determination that a reference is from a nonanalogous art is therefore twofold. First, we decide if the reference is within the field of the inventor's endeavor. If it is not, we proceed to determine whether the reference is reasonably pertinent to the particular problem with which the inventor was involved.

Both the instant claims and Nutting involve decaffeination of vegetable materials; whereas, Aeillo compares the solubility of a diuretic solution, such as a caffeine solution combined with an oil/serum mixture, to the same solution combined with an oil/water mixture. He determines that caffeine is "more soluble in serum than in water." From this he concludes that the Meyer/Overton lipoid theory of narcotics, which was based upon experiments using an oil/water mixture, is inaccurate because an oil/water mixture does not approximate the substances found in the human body. Thus, Aeillo's disclosure is not "within the field of the inventor's endeavor." Further, Aeillo is not pertinent to appellants' problem because he is not concerned with either beverage preparation or decaffeination of vegetable materials. There is no common environment which could form a "close

relationship" between either the claimed invention or Nutting on the one hand and Aeillo on the other to logically require consideration of Aeillo. In re Antle, 58 CCPA 1382, 1387, 444 F.2d 1168, 1171-72, 170 USPQ 285, 287-88 (1971). An earlier statement by this court in In re Van Wanderham, 54 CCPA 1487, 1494, 378 F.2d 981, 988, 154 USPQ 20, 25 (1967), is particularly appropriate: "Our determination here is not without difficulty. However, we think the difficulty arises from not considering the subject matter as a whole and instead focusing on the scientific principle involved ...."

In this case, the board erred by focusing on the affinity of olive oil for caffeine without considering the subject matter of Aeillo as a whole and the impropriety of the Aeillo reference, as pointed out above. (Pagliaro, 657 F.2d at 1224-1225.)

In the case at hand, the examiner did not consider Hokodate as a whole, just as the board in Pagliaro did not consider the Aeillo reference as a whole. Instead, the examiner simply focused on the fact that Hokodate disclosed a sampling circuit. (Final Office Action, 3.) However, when Hokodate is considered as a whole, one sees that the sampling circuit samples only a portion of a voltage from a detecting circuit that has a large signal-to-noise ratio, and having a large signal-to-noise ratio is one way Hokodate eliminates noise resulting from plasma or sputtering during machining. (Hokodate, column 11, lines 50-60 and column 12, lines 1-5.) Thus, Hokodate samples a signal in a different manner and for a different purpose than applicant. Also, Hokodate as a whole involves laser machining which is different than detecting contact between a person and a dangerous portion of a woodworking machine. For these reasons, Hokodate is not reasonably pertinent to applicant's invention just as Aeillo was not reasonably pertinent in Pagliaro for similar reasons. Id. at 1225.

Because Hokodate is from a different field of endeavor and not reasonably pertinent to the problem of detecting contact between a person and a dangerous portion of a woodworking machine, Hokodate is non-analogous and should not be considered.

This is an independent reason why the obviousness rejection at issue should be reversed.

2. There is no suggestion to combine the references.

Even if Hokodate were analogous art, which it is not, there still would have to be some teaching, suggestion, or motivation for the examiner to combine it with Friemann and Hughes. In re Rouffet, 149 F.3d 1350, 1355, 47 USPQ2d 1453 (Fed. Cir. 1998). The only motivation identified by the examiner to combine the references is the following:

It would be obvious to a person of ordinary skill in the art to provide Friemann [sic] safety system with the detection mechanism as taught by Hughes [sic] and the sampling circuit as taught by Kokodate [sic] in order to improve the safety system and the [sic] stop the operation of the dangerous portion only when a human hand approaches the dangerous portion. (Final Office Action, 3.)

The examiner did not identify any specific understanding or technical principle from the prior art suggesting the combination. He simply said the desire for improvement suggests the combination. But the simple desire to improve a system cannot by itself constitute a suggestion to combine references. If it did, then no improvement would be patentable because there is always a desire for improved products. Rather, there must be some express or implicit teaching, suggestion or motivation found in the prior art, or in the knowledge generally available to a person of ordinary skill in the art, to make the specifically claimed combination. Expressed differently, it is not the desire to make something better but the solution that must be suggested or taught, and that suggestion must be clear and particular.

This is explained by the case of In re Rouffet, 149 F.3d 1350, 1355, 47 USPQ2d 1453 (Fed. Cir. 1998). In that case the Board of Patent Appeals and Interferences affirmed the rejection of an application concerning a satellite communication system. The application addressed the problem of how to keep a receiver on the earth in communication with a satellite moving around the earth. Typically, a satellite transmits multiple signal beams to the earth and a receiver must switch from one beam to another as the satellite moves. This switching from beam to beam is referred to as a handover, and a disruption in communication is more likely during a handover. Rouffet minimized the number of handovers required by changing the shape of the transmitted beams from cones to fans. Fan-shaped beams have elliptical footprints that extend parallel to the direction of a satellite's motion. The elliptical footprints help ensure that a fixed point on the earth will remain within the satellite's beam. Id. at 1353.

The examiner rejected Rouffet's claims as obvious in light of a patent to King, a patent to Rosen, and a conference report by Ruddy. King disclosed a system to launch a plurality of low-orbit satellites. Rosen disclosed a geostationary satellite using fan-shaped beams oriented in an east-west direction. Ruddy disclosed a television broadcast system that transmitted a single fan-shaped beam upward from the earth into which satellites would successively enter. The fan-shaped beam was oriented so its long axis was aligned with the long axes of the satellites' orbits. Id. at 1356. The Board affirmed the examiner's rejection and added an alternative rejection based on the combination of two other patents. Rouffet then appealed to the Federal Circuit.

On appeal, the Federal Circuit found no error in the Board's conclusion that "the combination of King, Rosen, and Ruddy contains all of the elements claimed in

Rouffet's application." Id. at 1357. But the Federal Circuit did conclude that "the Board reversibly erred in determining that one of skill in the art would have been motivated to combine these references in a manner that rendered the claimed invention obvious." Id. The Federal Circuit said the Board erred by failing to identify any specific understanding or scientific principle suggesting the combination. The court explained that an examiner cannot simply find claim elements in the prior art and then combine them to arrive at the invention because such an approach would allow hindsight to influence the determination. Rather, an examiner must find the claim elements in the prior art and then specify how the prior art suggests or motivates the combination of those elements.

This is explained in the following discussion from Rouffet:

As this court has stated, "virtually all [inventions] are combinations of old elements." *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 698, 218 U.S.P.Q. 865, 870 (Fed. Cir. 1983); see also *Richdel, Inc. v. Sunspool Corp.*, 714 F.2d 1573, 1579-80, 219 U.S.P.Q. 8, 12 (Fed. Cir. 1983) ("Most, if not all, inventions are combinations and mostly of old elements.") Therefore an examiner may often find every element of a claimed invention in the prior art. If identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. Furthermore, rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach would be "an illogical and inappropriate process by which to determine patentability." *Sensonics, Inc. v. Aerosonic Corp.*, 81 F.3d 1566, 1570, 38 U.S.P.Q.2d 1551, 1554 (Fed. Cir. 1996).

To prevent the use of hindsight based on the invention to defeat patentability of the invention, this court requires the examiner to show a motivation to combine the references that create the case of obviousness. In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.

This court has identified three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art. In this case, the Board relied upon none of these. Rather, just as it relied on the high level of skill in the art to overcome the differences between the claimed invention and the selected elements in the references, it relied upon the high level of skill in the art to provide the necessary motivation. The Board did not, however, explain what specific understanding or technological principle within the knowledge of one of ordinary skill in the art would have suggested the combination. Instead, the Board merely invoked the high level of skill in the field of art. If such a rote invocation could suffice to supply a motivation to combine, the more sophisticated scientific fields would rarely, if ever, experience a patentable technical advance. Instead, in complex scientific fields, the Board could routinely identify the prior art elements in an application, invoke the lofty level of skill, and rest its case for rejection. To counter this potential weakness in the obviousness construct, the suggestion to combine requirement stands as a critical safeguard against hindsight analysis and rote application of the legal test for obviousness.

Because the Board did not explain the specific understanding or principle within the knowledge of a skilled artisan that would motivate one with no knowledge of Rouffet's invention to make the combination, this court infers that the examiner selected these references with the assistance of hindsight. This court forbids the use of hindsight in the selection of references that comprise the case of obviousness. See *In re Gorman*, 933 F.2d 982, 986, 18 U.S.P.Q.2d 1885, 1888 (Fed.Cir.1991). Lacking a motivation to combine references, the Board did not show a proper *prima facie* case of obviousness. This court reverses the rejection over the combination of King, Rosen, and Ruddy. (Rouffet, 149 F.3d at 1357-1358.)

This discussion is pertinent to the case at hand because the examiner in the present application did not identify any specific understanding or technological principle that would motivate a person of ordinary skill to select the various elements from the prior art and arrange them as set forth in applicant's claim 1, just as the Board in Rouffet failed to identify any such understanding or principle. The examiner in the case at hand simply invoked the desire to have an improved safety system, which is similar to the invocation of a high level of skill to justify the combination of King, Rosen and Ruddy in

Rouffet. As explained by the Federal Circuit, such rote invocations cannot provide the required motivation because then there would rarely be any patentable technical advance. Instead, a specific suggestion to make a combination is required, and that requirement must be diligently applied because, as the Federal Circuit has said, "invention itself is the process of combining prior art in a nonobvious manner." Id. at 1359.

Another case explaining the requirement of a specific suggestion to combine references is In re Dembiczak, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999) (citations omitted), *abrogated on other grounds* in In re Gartside, 203 F.3d 1305, 53 USPQ2d 1769 (Fed. Cir. 2000). In that case the Board of Patent Appeals and Interferences affirmed the rejection of an application concerning a trash bag made to look like a jack-o'-lantern when filled with leaves or trash. The application was rejected in light of conventional plastic trash bags combined with orange crepe paper jack-o'-lanterns (referred to as the Holiday reference) and paper bag pumpkins (referred to as the Shapiro reference). The Federal Circuit reversed the rejection because the Board did not identify a suggestion to make the combination. The Federal Circuit explained,

[R]ather than pointing to specific information in Holiday or Shapiro that suggest the combination with the conventional bags, the Board instead described in detail the similarities between the Holiday and Shapiro references and the claimed invention, noting that one reference or the other – in combination with each other and the conventional trash bags – described all of the limitations of the pending claims. ... Nowhere does the Board particularly identify any suggestion, teaching, or motivation to combine the children's art references (Holiday and Shapiro) with the conventional trash or lawn bag references, nor does the Board make specific -- or even inferential -- findings concerning the identification of the relevant art, the level of ordinary skill in the art, the nature of the problem to be solved, or any other factual findings that might serve to support a proper obviousness analysis. ...



...Yet this reference-by-reference, limitation-by-limitation analysis fails to demonstrate how the Holiday and Shapiro references teach or suggest their combination with the conventional trash or lawn bags to yield the claimed invention. ... Because we do not discern any finding by the Board that there was a suggestion, teaching, or motivation to combine the prior art references cited against the pending claims, the Board's conclusion of obviousness, as a matter of law, cannot stand. (Dembiczak, 175 F.3d at 1000.)

Just as in Dembiczak, the examiner in the case at hand made a reference-by-reference, limitation-by-limitation analysis without identifying any specific teaching or suggestion in the prior art to make the combination. In other words, the examiner simply found what he thought were the elements of applicant's claims and then combined those elements according to applicant's teachings. As explained in Dembiczak, that type of analysis cannot support a conclusion of obviousness. The Federal Circuit clearly stated: "Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability – the essence of hindsight." Id. at 999. In the case at hand, just as in Dembiczak, the examiner "fell into the hindsight trap." Id.

The examiner's use of hindsight is evident from his conclusion that the combination of Friemann, Hughes and Hokodate would result in an improved safety system. Why would the examiner reach that conclusion? The system disclosed in Friemann already detects contact and the system disclosed in Hughes detects proximity, so how would the combination of those references with Hokodate result in an improved system? In fact, wouldn't a person of ordinary skill reviewing those references conclude that the system disclosed in Hughes would be safer because detecting proximity is safer than detecting contact? Applicant's disclosure is the only disclosure

teaching the advantages of a system as described in claim 1, and therefore, it is apparent that the examiner said the combination of Friemann, Hughes and Hokodate would result in an improved system because he had reviewed applicant's disclosure.

Rather than suggesting the combination, Friemann's disclosure of a contact detection circuit and Hughes' disclosure of a proximity detection system point away from the combination. Assuming those systems work as stated, there would be no reason for a person of ordinary skill to change them by combining them together with Hokodate. Moreover, combining Friemann, Hughes and Hokodate as suggested by the examiner would change the principles of operation of Friemann and Hughes. The principle of operation of Friemann's device is to detect an imbalance in a bridge circuit. Modifying Friemann to sample a signal as set forth in applicant's claim 1 would change that principle. The principle of operation of Hughes' system is to detect proximity, and changing Hughes to detect contact would change that principle. The Federal Circuit has explained that if a proposed combination would change the principle of operation of the device being modified, then there is no suggestion to make the combination. In re Ratti, 270 F.2d 810, 813, 123 USPQ 349 (CCPA 1959); MPEP 2143.01.

All these reasons show that there is no teaching, motivation or suggestion to combine the cited references. This is a second independent reason why applicant's claim 1 is not obvious.

3. The cited references fail to teach or suggest all claim limitations.

The cited references must teach or suggest all of the limitations from claim 1 in order for claim 1 to be obvious in light of those references. See, e.g., 35 USC 103(a) (question is whether "the subject matter *as a whole* would have been obvious");

Application of Royka, 490 F.2d 981, 985 (CCPA 1974) (claim not obvious because limitation missing from cited references); Application of Wilson, 424 F.2d 1382, 1385 (CCPA 1970) ("All words in a claim must be considered in judging the patentability of that claim against the prior art."); MPEP 2143.03 ("To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.") The cited references, however, fail to teach or suggest all of the limitations from claim 1, and therefore, the combination of cited references cannot render the claim obvious.

Claim 1 describes a method for detecting accidental contact between a person and a dangerous portion of a woodworking machine. The method provides a first electrode coupled to a person and a second electrode coupled to the dangerous portion of the machine. A signal is transmitted by one of the electrodes to the other and the signal is sampled a plurality of times within 200 microseconds to determine if the signal has at least one predetermined characteristic indicative of contact between a person and the dangerous portion.

The limitation of sampling the signal within 200 microseconds is one of the limitations not taught by any cited reference. This limitation addresses the fact that the dangerous portion of a woodworking machine may be a toothed blade, and in the event of an accident, the teeth of the blade will be in contact with a person intermittently because of the gullets between the teeth. Sampling the signal within 200 microseconds means that the method will likely detect contact as the first tooth cuts into the person because 200 microseconds is the approximate time it would take one tooth of a 10" circular saw blade spinning at approximately 4000 rpm to travel ½ inch, which is about

the width of a finger. Additionally, sampling the signal a plurality of times within 200 microseconds allows the method to check and re-check for contact as the first tooth cuts into the person. This makes the method more robust and helps insure the method detects contact, even intermittent contact with the teeth of a spinning blade.

The examiner admits that none of the cited references discusses sampling a signal a plurality of times within 200 microseconds to detect contact. (Final Office Action, 2-3.) Nevertheless, the examiner says Hokodate discloses sampling a signal generally, and in light of that disclosure, it would have been obvious to sample a signal a plurality of times within 200 microseconds "since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art." (Final Office Action, 3.)

The limitation in question, however, is not a "result effective variable" that can be optimized by the use of routine skill in the art. A "result effective variable" is "a variable which achieves a recognized result." MPEP 2144.05 (II.)(B.); see also Application of Antoine, 559 F.2d 618, 620, 195 USPQ 6 (CCPA 1977). In the case at hand, there is no indication in any cited reference that determining whether a signal has a predetermined characteristic indicative of contact is a recognized result. Additionally, the cited references fail to identify any variable that may be set to optimize detection of contact between a person and the dangerous portion. Furthermore, none of the cited references teach or suggest any reason to sample a signal multiple times to detect contact, or even whether sampling a signal multiple times could effect the result of detecting contact. Thus, the limitation at issue is not a "result effective variable." To the contrary, the limitation in question addresses the unique situation of a person coming into contact,

and potentially intermittent contact, with a dangerous portion of a woodworking machine. The limitation was developed through study and experimentation; not through the simple application of routine skill in the art. There simply is no teaching or suggestion in any cited reference that Hokodate should be or even could be modified to sample a signal as specified by applicant's claim 1.

In fact, Hokodate teaches away from sampling a signal a plurality of times within 200 microseconds to detect contact. As explained, Hokodate discloses a distance detector for a laser beam machine. The distance detector is used to measure the focal point or nozzle height of the laser above a workpiece without regard to plasma or sputter generated during laser machining. The distance detector includes a sensing electrode positioned adjacent a workpiece, and the capacitance between the electrode and the workpiece is used to determine the desired distance. (Hokodate, column 3, line 48 to column 4, line 8.) In one embodiment, the distance is determined by a phase shifting circuit 17 and a sampling circuit 20. (Column 11, lines 50-51.) The sampling circuit "samples the detection output of the detecting circuit 8 at a fixed period, on the basis of the information of the output of the voltage source 15 that has been made in-phase by the phase shifting circuit 17." (Column 11, lines 57-60.) In this manner, "the sampling circuit 20 samples only a portion of desired phase, e.g. a portion of a phase having large amplitude at a fixed period, from a voltage detected by the detecting circuit 8. In other words, the sampling circuit 20 samples only a portion having a large SN ratio." (Column 12, lines 1-5.)

Hokodate teaches away from sampling a signal a plurality of times within 200 microseconds by instead sampling a signal based on the output of a voltage source that

has been made in phase by a phase shifting circuit. Hokodate samples at a fixed period based on phase in order to sample a portion of the signal having a large signal-to-noise ratio, and having a large signal-to-noise ratio is one way Hokodate eliminates noise resulting from plasma or sputtering during machining. Thus, Hokodate not only fails to suggest the limitation of claim 1, it teaches away from the limitation.

If Hokodate were modified to sample as set forth in claim 1, then Hokodate would no longer function as intended because it would no longer sample the portion of the signal having a large signal-to-noise ratio and therefore would not overcome noise from plasma or sputtering. Because Hokodate would no longer function as intended if it were modified to sample as required by claim 1, Hokodate cannot provide a suggestion or motivation to combine the cited references. See In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125 (Fed. Cir. 1984) (holding it would not have been obvious to turn a prior art blood filter upside down to arrive at applicant's invention because that change would render the prior art filter inoperable for its intended purpose). Additionally, modifying Hokodate to sample a signal as set forth in claim 1 would change Hokodate's principle of operation from sampling based on phase to sampling a plurality of times within 200 microseconds, and therefore Hokodate cannot render claim 1 obvious. See In re Ratti, 270 F.2d 810, 813, 123 USPQ 349 (CCPA 1959) (combination was improper because the "suggested combination of references would require a substantial reconstruction and redesign of the elements ... as well as a change in the basic principles under which the ... construction was designed to operate").

Claim 1 also includes the limitation of "providing a first electrode electrically coupled to [a] person." The examiner says that the Friemann reference discloses that

limitation because a capacitance is altered when a person contacts the blade in Friemann's system. In other words, the examiner equates contact between the person and the blade with the step of providing a first electrode coupled to a person. (Final Office Action, 2.) Applicant disagrees. The plain meaning of the limitation in claim 1 is to provide a first electrode coupled to a person, and nothing in Friemann discloses that limitation. Interpreting the limitation to mean contact with the blade is inconsistent with the preamble of the claim, which specifies that all the limitations together comprise: "A method for detecting accidental contact between a person and a dangerous portion of a woodworking machine." Interpreting the "first electrode" limitation would also be inconsistent with the limitation of "sampling the signal a plurality of times within 200 microseconds to determine if the signal has at least one predetermined characteristic indicative of contact between a person and the dangerous portion." Thus, the examiner's interpretation is incorrect.

Claim 1 also requires the limitations of "transmitting a signal by one of the first or second electrodes" and "detecting whether the transmitted signal is received by the other of the first or second electrodes." Friemann fails to teach or suggest these limitations. Instead, Friemann discloses a bridge circuit in which a capacitance changes when a person contacts the blade. (Friemann, column 3, lines 7-26.)

The fact that the cited references fail to disclose all claim limitations is a third independent reason why claim 1 is not obvious.

**Claim 24**

Claim 24 depends from claim 1 and is not obvious for the same reasons as claim 1. Claim 24 also specifies that "the predetermined characteristic indicative of contact between a person and the dangerous portion distinguishes such contact from proximity between a person and the dangerous portion." The examiner says Friemann as modified teaches this limitation. (Final Office Action, 4.) Applicant disagrees. Neither Friemann nor Hughes suggests sampling a signal a plurality of times within 200 microseconds to determine if the signal has at least one predetermined characteristic that distinguishes *contact* from *proximity*. To the contrary, Friemann only suggests detecting contact through a bridge circuit, as explained, and Hughes only suggests detecting proximity. The examiner did not identify any predetermined characteristic in any cited reference that distinguishes contact from proximity, nor did he explain how the cited references could sample such a characteristic. Accordingly, the examiner has not established obviousness so the rejection should be reversed.

**Claim 25**

Claim 25 depends from claim 24 and is not obvious for the same reasons as claim 24. Claim 25 also specifies that "the predetermined characteristic indicative of contact between a person and the dangerous portion involves peak-to-peak amplitude." The examiner says Friemann as modified by Hokodate suggests this limitation, but he does not identify where the references suggest that modification. (Final Office Action, 4.) Applicant disagrees because neither Friemann nor Hokodate suggests sampling a signal a plurality of times within 200 microseconds to determine if the signal has at least one predetermined characteristic involving peak-to-peak amplitude that distinguishes



contact from proximity. In fact, neither Friemann nor Hokodate suggests that peak-to-peak amplitude may be sampled a plurality of times to indicate contact between a person and a dangerous portion of a woodworking machine. Therefore, the examiner has not established the obviousness of this claim so the rejection should be reversed.

#### **Claim 26**

Claim 26 depends from claim 24 and is not obvious for the same reasons as claim 24. Claim 26 also specifies that "the predetermined characteristic indicative of contact between a person and the dangerous portion involves phase." The examiner says Friemann as modified by Hokodate teaches this limitation. (Final Office Action, 4.) Applicant disagrees with this rejection because neither Friemann nor Hokodate suggests sampling a signal a plurality of times within 200 microseconds to determine if the signal has at least one predetermined characteristic involving phase that distinguishes contact from proximity. As with claims 24 and 25, neither Friemann nor Hokodate disclose how the phase of a signal may be sampled to detect contact, or even that phase could indicate contact, and the examiner did not identify where the cited references suggest that limitation.

#### **Claim 27**

Claim 27 depends from claim 24 and is not obvious for the same reasons as claim 24. Claim 27 also specifies that "the predetermined characteristic indicative of contact between a person and the dangerous portion involves a positive value." The examiner says Friemann as modified by Hokodate teaches this limitation. (Final Office Action, 4.) Again applicant disagrees because neither Friemann nor Hokodate suggests sampling a signal a plurality of times within 200 microseconds to determine if the signal

has at least one predetermined characteristic involving a positive value. In fact, Friemann and Hokodate both fail to disclose how a positive value of a signal may be sampled to indicate contact, or even that a positive value could indicate contact, and the examiner did not identify where the cited references suggest that limitation.

#### **Claim 28**

Claim 28 depends from claim 24 and is not obvious for the same reasons as claim 24. Claim 28 also specifies that "the predetermined characteristic indicative of contact between a person and the dangerous portion involves a negative value." The examiner says Friemann as modified by Hokodate teaches this limitation, but does not explain how. (Final Office Action, 4.) As with claim 27, applicant disagrees with the examiner because neither Friemann nor Hokodate suggests sampling a signal a plurality of times within 200 microseconds to determine if the signal has at least one predetermined characteristic involving a negative value that distinguishes contact from proximity. Friemann and Hokodate fail to disclose how a negative value of a signal may be sampled to indicate contact, or even that a negative value could indicate contact. The examiner did not identify where the cited references suggest this limitation.

#### **Claim 29**

Claim 29 is an independent claim. It is not obvious because Hokodate is non-analogous art and because there is no suggestion to combine the cited references, as explained above. Additionally, claim 29 includes a number of limitations that are neither taught nor suggested by the cited references. Specifically, claim 29 recites "providing a first electrode electrically coupled to the person" and that limitation is neither taught nor suggested by the cited references, as discussed above. The claim also recites

"providing a second electrode electrically coupled to the dangerous portion," "transmitting a signal by one of the first or second electrodes," and "receiving the transmitted signal by the other of the first or second electrodes." None of the cited references transmit a signal between an electrode coupled to a person and an electrode coupled to the dangerous portion. Finally, claim 29 recites "performing a step of sampling the signal a plurality of times to determine if the signal has at least one predetermined characteristic indicative of contact between a person and the dangerous portion." As explained above, nothing in the cited references teaches or suggests sampling a signal a plurality of times to detect contact between a person and the dangerous portion of a woodworking machine.

#### **8. Claims appendix.**

1. A method for detecting accidental contact between a person and a dangerous portion of a woodworking machine, the method comprising:
  - providing a first electrode electrically coupled to the person;
  - providing a second electrode electrically coupled to the dangerous portion;
  - transmitting a signal by one of the first or second electrodes;
  - detecting whether the transmitted signal is received by the other of the first or second electrodes; and if so,
  - sampling the signal a plurality of times within 200 microseconds to determine if the signal has at least one predetermined characteristic indicative of contact between a person and the dangerous portion.
2. The method of claim 1, where the step of transmitting includes transmitting the signal by the first electrode through the person.

3. The method of claim 1, where the step of transmitting includes transmitting the signal by the second electrode through the dangerous portion.
4. The method of claim 1, where the woodworking machine includes at least one cutting tool, and where the step of providing a second electrode includes providing a second electrode electrically coupled to the at least one cutting tool.
5. The method of claim 1, where the woodworking machine includes at least one guard, and where the step of providing a second electrode includes providing a second electrode electrically coupled to the at least one guard.
6. The method of claim 1, where the step of transmitting includes transmitting an alternating electrical signal.
7. The method of claim 6, where the alternating electrical signal has a particular frequency, and where the step of identifying includes identifying contact if an electrical signal having the particular frequency is received.
8. The method of claim 1, where the step of transmitting includes transmitting a ground electrical signal.
- 9-20. (Cancelled.)
21. The method of claim 1, where the dangerous portion is a blade with cutting teeth, and where the sampling occurs while a single tooth is in contact with the person.
22. The method of claim 1, where the sampling occurs within 100 microseconds.
23. The method of claim 1, where the sampling occurs in less than 100 microseconds.

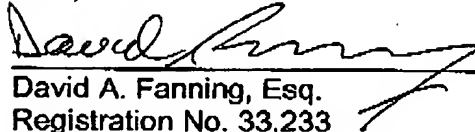
24. The method of claim 1, where the predetermined characteristic indicative of contact between a person and the dangerous portion distinguishes such contact from proximity between a person and the dangerous portion.
25. The method of claim 24, where the predetermined characteristic indicative of contact between a person and the dangerous portion involves peak-to-peak amplitude.
26. The method of claim 24, where the predetermined characteristic indicative of contact between a person and the dangerous portion involves phase.
27. The method of claim 24, where the predetermined characteristic indicative of contact between a person and the dangerous portion involves a positive value.
28. The method of claim 24, where the predetermined characteristic indicative of contact between a person and the dangerous portion involves a negative value.
29. A method for detecting accidental contact between a person and a dangerous portion of a woodworking machine, the method comprising:
- providing a first electrode electrically coupled to the person;
  - providing a second electrode electrically coupled to the dangerous portion;
  - transmitting a signal by one of the first or second electrodes;
  - receiving the transmitted signal by the other of the first or second electrodes; and
  - performing a step of sampling the signal a plurality of times to determine if the signal has at least one predetermined characteristic indicative of contact between a person and the dangerous portion.

**9. Evidence appendix.**

None.

**10. Related proceedings appendix.**

None.

Respectfully submitted,  
SD3, LLC  
\_\_\_\_\_  
David A. Fanning, Esq.

Registration No. 33,233

Customer No. 27630

22409 S.W. Newland Road


Wilsonville, Oregon 97070

Telephone: (503) 638-6201

Facsimile: (503) 638-8601

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Date: October 10, 2005  
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David A. Fanning